

WHAT IS CLAIMED IS:

- 1                   1.       For use in a vehicle wheel rim, a grommet and valve stem  
2 assembly, the assembly comprising:  
3                   a grommet having;  
4                   a nose section at a first end of the grommet, the nose having  
5 a substantially conical shape configured for insertion into an inflation hole in the  
6 vehicle wheel rim;  
7                   a cylindrical section sized to match the inflation hole and  
8 having a first end adjoined to the nose section;  
9                   a flange section projecting radially outward from a second end  
10 of the cylindrical section, the flange section having a substantially flat surface  
11 opposite to the cylindrical section, wherein at least one interface seal is formed on  
12 the flat surface as a hemispherical projection located concentrically about a center  
13 axis of the grommet; and  
14                   an axial bore passing centrally through the grommet body; and  
15                   a valve stem configured to be inserted through the bore of the  
16 grommet, the valve stem comprising a threaded portion configured to receive a  
17 retaining nut and a flange having a substantially flat surface that is configured to  
18 form at least one sealing interface with the at least one interface seal when the  
19 retaining nut is tightened to the valve stem.
- 1                   2.       The assembly of claim 1 wherein the grommet comprises a  
2 synthetic rubber.
- 1                   3.       The assembly of claim 1 further comprising an annular section  
2 located between a base of the nose section and the cylindrical section, the annular  
3 section projecting radially outward from the base of the nose section.
- 1                   4.       The assembly of claim 3 wherein at least one further sealing  
2 interface is formed between the annular section of the grommet and a recess in the  
3 retaining nut assembly when the retaining nut is tightened to the valve stem.

1                   5.     The assembly of claim 1 wherein at least one further sealing  
2 interface is formed between the cylindrical section and an inner surface of the  
3 inflation hole when the retaining nut is tightened.

1                   6.     The assembly of claim 3 wherein the at least one further  
2 sealing interface is formed between the annular section and an outside surface of the  
3 wheel rim.

1                   7.     The assembly of claim 1 wherein the retaining nut further  
2 comprises a flat seal and at least one further sealing interface is formed between the  
3 flat seal and an outside surface of the vehicle wheel rim.

1                   8.     The assembly of claim 7 wherein the at least one sealing  
2 interface provides an electrically insulative path between the valve stem and the  
3 vehicle wheel rim.

1                   9.     A method of reducing air leakage at a vehicle tire valve stem  
2 and grommet assembly, the method comprising:  
3                   inserting a grommet into an inflation hole, the grommet comprising:  
4                   a nose section at a first end of the grommet, the nose having  
5 a substantially conical shape configured for insertion into an inflation hole in the  
6 vehicle wheel rim;  
7                   a cylindrical section sized to match the inflation hole and  
8 having a first end adjoined to the nose section;  
9                   a flange section projecting radially outward from a second end  
10 of the cylindrical section, the flange section having a substantially flat surface  
11 opposite to the cylindrical section, wherein at least one interface seal is formed on  
12 the flat surface as a hemispherical projection located concentrically about a center  
13 axis of the grommet; and  
14                   an axial bore passing centrally through the grommet body; and  
15                   inserting a valve stem through the bore, the valve stem comprising:  
16                   a threaded portion configured to receive a retaining nut; and

17 a flange having a substantially flat surface that is configured  
18 to form at least one sealing interface with the at least one interface seal when the  
19 retaining nut is tightened to the valve stem; and  
20 tightening the retaining nut on the valve stem.

1 10. The method of claim 9 wherein the grommet further comprises  
2 an annular section located between a base of the nose section and the cylindrical  
3 section, the annular section projecting radially outward from the base of the nose  
4 section.

1 11. The method of claim 9 wherein at least one further sealing  
2 interface is formed between the annular section of the grommet and a recess in the  
3 retaining nut assembly when the retaining nut is tightened to the valve stem.

1 12. The method of claim 9 wherein at least one further sealing  
2 interface is formed between the cylindrical section and an inner surface of the  
3 inflation hole when the retaining nut is tightened.

1 13. The method of claim 10 wherein the at least one further  
2 sealing interface is formed between the annular section and an outside surface of the  
3 wheel rim.

1 14. The method of claim 9 wherein the retaining nut further  
2 comprises a flat seal and at least one further sealing interface is formed between the  
3 flat seal and an outside surface of the vehicle wheel rim.

1 15. The method of claim 9 wherein the at least one sealing  
2 interface provides an electrically insulative path between the valve stem and the  
3 vehicle wheel rim.

1 16. A grommet for use in a wheel rim inflation hole, the grommet  
2 comprising:

3                   a nose section at a first end of the grommet, the nose having a  
4 substantially conical shape configured to be inserted into the inflation hole;  
5                   an annular section at a base of the nose section, the annular section  
6 projecting radially outward from the base of the nose section;  
7                   a cylindrical section sized to match the inflation hole and having a  
8 first end adjoined to the annular section;  
9                   a flange section projecting radially outward from a second end of the  
10 cylindrical section; and  
11                   a bore passing axially through the grommet body, the bore configured  
12 to receive a valve stem assembly.

1                   17.    The grommet of claim 16 wherein the grommet comprises a  
2 synthetic rubber.

1                   18.    The grommet of claim 16 wherein at least one sealing  
2 interface is formed between the cylindrical section of the grommet and an inner  
3 surface of the tire inflation hole.

1                   19.    The grommet of claim 16 wherein at least one sealing  
2 interface is formed between the flange section of the grommet and an inside surface  
3 of the wheel rim.

1                   20.    The grommet of claim 16 wherein at least one sealing  
2 interface is formed between the annular section of the grommet and an outside  
3 surface of the wheel rim.